Competitive Carriers Association
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**Competitive Carriers Association**
**805 15th Street NW, Suite 401**
**Washington, DC 20005**
**Office: (202) 449 -9866 • Fax: (866) 436 -1080**

February 26, 2013

**Via ECFS**

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

**Re: WT Docket No. 12-69**

Dear Ms. Dortch:

On the eve of the 2013 Mobile World Congress in Barcelona, Qualcomm last week announced the release of a product it calls "RF360 Front End Solution."[1] According to Qualcomm, this product offers "a comprehensive, system-level solution that addresses cellular radio frequency band fragmentation" and can not only support all of the more than forty LTE band classes in existence today, but also allow seamless backward compatibility to 3G and 2G networks.[2]

Band fragmentation has caused a lack of interoperability in the Lower 700 MHz band. CCA engaged industry expert Doug Hyslop to assess the interoperability benefits which may be enabled by the RF360 product. Mr. Hyslop concluded that Qualcomm's RF360 product announcement confirms the underlying capabilities of multi-mode chipsets and establishes the feasibility of Lower 700 MHz interoperability on a timely and cost-effective basis.

Proponents of interoperability have long maintained that manufacturers can restore interoperability to the Lower 700 MHz band without changing any device hardware other than replacing one duplex filter with another at a marginal cost approaching zero.[3] Extensive record evidence from multiple sources supports the conclusion that interoperability is both feasible and cost-effective.[4]

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1 Qualcomm, Press Release, *Qualcomm RF360 Front End Solution Enables Single Global LTE Design for Next-Generation Mobile Devices* (Feb. 21, 2013), http://www.qualcomm.com/media/releases/2013/02/21/ qualcomm-rf360-front-end-solution-enables-single-global-lte-design-next (hereinafter, "Press Release").

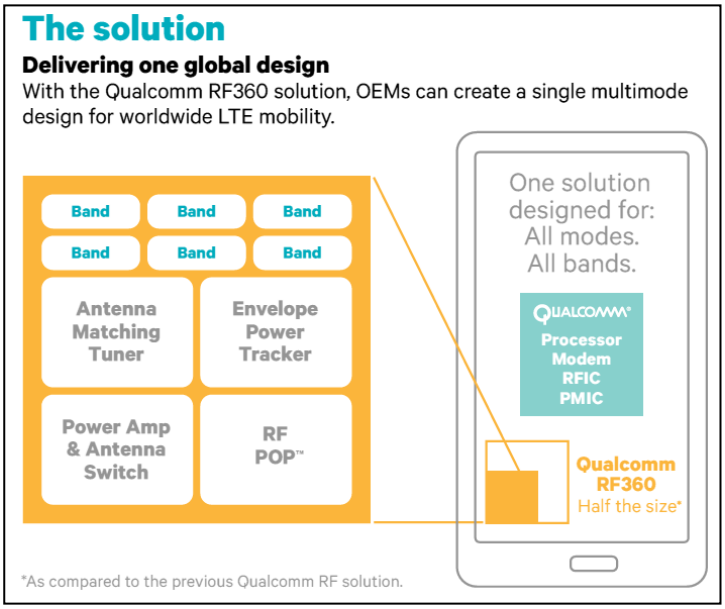
2 *Id.*

3 *See, e.g., Ex Parte* Letter of Competitive Carriers Association to M. Dortch, Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (Jan. 31, 2013), at 1-2 *available at* http://apps.fcc.gov/ecfs/document/view?id=7022115923; Notice of *Ex Parte* Presentations by Vulcan Wireless LLC and Cellular S., Inc., Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (Oct. 10, 2012), at 2, *available at* http://apps.fcc.gov/ecfs/document/view?id=7022032441 ("The manufacturing of new interoperable mobile devices would require the replacement of a single piece of hardware, a duplex filter, and the marginal cost of using a Band Class 12 duplex filter instead of a Band Class 17 duplex filter is *zero* with scale purchasing.") (emphasis in original).

4 *See e.g.,* Hyslop & Kolodzy, *Lower 700 MHz Test Report: Laboratory and Field Testing of LTE Performance Near Lower E Block and Channel 51 Broadcast Stations* (Apr. 11, 2012) (attached to Notice of *Ex Parte* Presentations by Cavalier Wireless, C. Spire Wireless, Continuum 700 LLC, King Street Wireless, L.P., MetroPCS Commc'ns, Inc.,

While some have claimed that deploying a single interoperable product in the Lower 700 MHz band would be technically infeasible, prone to interference, overly complex or cost prohibitive,[5] release of Qualcomm's "RF360 Front End Solution" should put to rest any remaining doubt about the feasibility, cost-effectiveness, and consumer benefit of restoring interoperability to the Lower 700 MHz band.

As a threshold matter, much of the technology behind Qualcomm's "RF360 Front End Solution" is not new. Qualcomm has long produced multi-technology chipsets[6] that allow a single piece of hardware to support CDMA, UMTS, and LTE air interfaces.[7] "[A]ll chipsets that support 4G," Qualcomm previously explained, "also support 3G and 2G technologies."[8]




*In its promotional literature, Qualcomm describes how RF360 supports many band classes in a single device*

Qualcomm's RF360 product announcement demonstrates three principles:

First, interoperable equipment is feasible. As Qualcomm explains, the new RF360 product integrates "a multimode, multiband power amplifier and antenna switch, with all the associated SAW filters

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U.S. Cellular, and Vulcan Wireless, Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (May 29, 2012)), *available at* http://apps.fcc.gov/ecfs/document/view? id=7021920804; Comments of Cavalier Wireless, LLC and Continuum 700 LLC, Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (June 1, 2012), *available at* http://apps.fcc. gov/ecfs/comment/view?id=6017037833; Reply Comments of Cellular S., Inc. Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (July 16, 2012), *available at* http://apps.fcc. gov/ecfs/comment/ view?id=6017096279; Reply Comments of Dish Network L.L.C., Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69, (July 16, 2012), *available at* http://apps.fcc.gov/ecfs/ comment/view?id=6017096288.

5 *See, e.g.,* Comments of Qualcomm Inc., Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (June 1, 2012), at 63 (stating that Qualcomm "does not have a technical solution at this time that would support seamless roaming between Band 12 and another LTE roaming band, and even if it did, compatibility issues between different carrier networks likely would create additional obstacles to seamless roaming"), 65 ("A Commission interoperability mandate eliminating Band 17 would impose significant costs and operational constraints on Qualcomm."), *available at* http://apps.fcc.gov/ecfs/ comment/view?id=6017037889; Reply Comments of Qualcomm Inc. Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (July 16, 2012) at 1 ("[T]he analysis contained in Qualcomm's initial comments should lead the Commission to conclude that E Block and Channel 51 signals would cause harmful interference to Band 12 devices operating on the B and/or C Blocks and that existing technology does not offer a solution to these challenges"),4 (stating that "differences in Band 17 and Band 12 filter requirements mean that additional hardware is needed to add support for Band 12"), & 4 n.5 (stating that "[a]dditional hardware also would be required to add support for Band 12 since the Band 12 and 17 filters perform differently").

6 *See* Qualcomm, *Our Businesses*, http://www.qualcomm.com/about/businesses (last visited Feb. 25, 2013).

7 The original equipment manufacturer, in other words, does not have to change anything in its hardware to allow CDMA carriers to enjoy the scale economies of Band Class 12 devices. A CDMA carrier would simply have its Qualcomm multi-technology chipsets receive a software load for the CDMA air interface while devices destined for AT&T would receive a GSM/UMTS software load.

8 Comments of Qualcomm Inc., Development of the Nationwide Interoperable Public Safety Broadband Network, National Telecommunications and Information Administration, Docket No. 120928505-2505-01, at 7 (Nov. 9, 2012), *available at* http://www.ntia.doc.gov/files/ ntia/qc_comments_on_firstnet_noi.pdf.

and duplexers for the required 2G/3G/4G LTE frequency bands in a single package."[9] As a result, the RF360 allows original equipment manufacturers to assemble "a highly integrated multiband, multimode, single-package RF front-end solution."[10] The use of a multi-mode, multi-band power amplifier demonstrates that the Qualcomm chipsets are capable of supporting more than one band class per set of low-frequency band ports, which is the main limitation touted by Qualcomm in the past.[11] Thus, there are no barriers to implementing the interoperability requirement that all LTE-capable devices support operation in the Lower A, B and C Blocks.

Second, interoperable equipment is cost effective. As Qualcomm says, its new RF360 product "reduces design complexity and development costs, allowing [original equipment manufacturer] customers to develop new multiband, multimode LTE products faster and more efficiently."[12]

Third, interoperable equipment is beneficial. As Qualcomm says, an integrated solution that supports multiple band classes offers vendors "lower development cost" and faster development speeds[13] with the goal of allowing cost-effective volume purchases of a single Stock Keeping Unit, or SKU, for each product design.[14]

Without timely Commission action, however, consumers in the United States may never realize the benefits of an interoperable product in the Lower 700 MHz band. In its coverage of Qualcomm's RF360 announcement, the *Wall Street Journal* quoted one industry analyst as noting that, even with the most advanced technology, a company "still needs financial motivation to ship a smartphone with an additional frequency band enabled."[15] And that lack of financial motivation is exactly the problem advocates of interoperability have tried, and so far have failed, to overcome.

AT&T simply has no economic motivation to include Band Class 12 in its devices. In fact, AT&T has a strong incentive *not* to incorporate inclusive technology into its devices because excluding adjacent Band Class 17 frequencies from AT&T's devices increases consumer switching costs and reduces the likelihood of costly churn from AT&T's network.[16] That's not to say that every band must or even should interoperate, but we simply note that AT&T, as a rational economic actor, will necessarily weigh whatever benefits any inclusive device solution might offer against the immediate "cost" of allowing consumers greater ability to choose a carrier other than AT&T based on price, service, and quality. To be clear, CCA is not recommending that the FCC require interoperability among random widely separated spectrum bands or all 40 LTE bands worldwide as Qualcomm's chipset permits. Rather, CCA merely reiterates its narrow request to restore interoperability between the currently orphaned 12 MHz A Block to the adjacent B and C Blocks in the Lower 700 MHz band as originally anticipated and designed by 3GPP.

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9 Qualcomm, *RF360 Front End Solution*, at 2, http://www.qualcomm.com/media/documents/files/qualcomm-rf360-front-end-solution-product-brief.pdf (last visited Feb. 25, 2013) (hereinafter "Product Brief").

10 *Id.*

11 The RF360 provides the radiofrequency components which complete the communication chain from the chipset to the antenna. Qualcomm's design of the RF360 includes multi-band power amplifiers because the same power amplifier will be used to implement the transmit path for multiple LTE band classes.

12 PR Newswire, *Qualcomm RF360 Front End Solution Enables Single, Global LTE Design for Next-Generation Mobile Devices,* NASDAQ (Feb. 21, 2013, 7:30 a.m.), http://www.nasdaq.com/article/qualcomm-rf360-front-end-solution-enables-single-global-lte-design-for-next-generation-mobile-devices-20130221-00296#.USqF5VqFSjJ.

13 Product Brief, *supra* note 11, at 1.

14 *See* Press Release, *supra* note 1.

15 Don Clark, *Qualcomm Aims at New Mobile-chip Segment, Roiling Rivals,* THE WALL STREET J. (Feb. 21, 2013, 1:30 p.m.), http://blogs.wsj.com/digits/2013/02/21/qualcomm-aims-at-new-mobile-chip-segment-roiling-rivals/

16 AT&T's 700 MHz licenses are limited to frequencies covered by Band Class 17; therefore, when AT&T excludes Band Class 12 frequencies from its devices, AT&T makes porting the devices from AT&T to another carrier impossible and effectively precludes roaming in the Lower 700 MHz band.

As Qualcomm's RF360 product shows, the challenge with interoperability is not one of technology, complexity, or cost, but one of market power. Restoring interoperability to the Lower 700 MHz band corrects the market failure that results from AT&T's skewed incentives against inclusive technology. Interoperability will increase competition among wireless carriers and allow consumers to switch providers without requiring them to purchase costly new mobile phones, tablets, and computers.[17] The Commission should restore interoperability to the Lower 700 MHz band without delay.

Sincerely,

*/s/ Rebecca Murphy Thompson*

Rebecca Murphy Thompson
General Counsel, Competitive Carrier Association

cc: Zachary Katz
Renee Gregory
Ruth Milkman
James Schlichting
Doug Hyslop

[17] *Ex Parte* Letter of Vulcan Wireless LLC to M. Dortch, Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69 (Jan. 31, 2013), at 4 *available at* http://apps.fcc.gov/ecfs/comment/view?id=6017161536.